HUMAN CHEMISTRY

T
58
F2

WILLIAM ARMSTRONG FAIRBURN

Class T58

Book F2

Copyright No.

COPYRIGHT DEPOSIT.

Human Chemistry

Human Chemistry

BY

WILLIAM ARMSTRONG FAIRBURN

THE NATION PRESS, Inc.
20 Vesey Street
New York

T58
.F2

Copyright, 1914, by William Armstrong Fairburn
All rights reserved
Published November, 1914

NOV 13 1914
©CLA388365
no 1

To

E. R. S.

with grateful appreciation for opportunity
and encouragement

Human Chemistry

E are thinking and talking a great deal now-a-days about placing the right man in the right job, about putting round pegs in round holes and square pegs in square holes, and this subject is one of the most vital problems that confronts us all, whether we work for others or employ men to work for us.

There is, however, a phase of this broad subject that should not be ignored, and that is the responsibility of the employer or handler of workers, whether he be Manager, Foreman or Gang Boss, in the placing and using of his men and in his intelligent planning and utilization of their efforts individ-

ually and in combination, in order that the greatest efficiency and harmony, and therefore the greatest success and happiness, may prevail.

All men are like chemical elements in a well-stocked laboratory, and the manager, foreman, or handler of men, in his daily work, may be considered as the chemist.

The first requisite of a chemist is an absolute knowledge of his laboratory materials, both singly and in combination one with the other. The primary requirement of a successful handler of men is a thorough knowledge of the characteristics and temperament of each individual and the reactions resulting from combinations of individuals.

The principal work of a chemist is analysis and synthesis. By analysis he separates compounds into their constituent elements, and

by synthesis he constructs that combination of elements which will be most efficient for the work to be performed.

A human chemist is required to separate systems compounded by old non-scientific methods of management into their constituent human chemical elements, and then with a definite, preconceived plan, compound these individuals, in the proper relative proportions, into an organization, both harmonious and effective for performing the desired functions.

A chemist, to cope with any problem or condition, must have accurate knowledge of the requirements of the work to be performed as well as a complete knowledge of the characteristics of his chemicals. Many human chemists flounder around in real life, ignoring both the requirements of the work and the characteristics of the individu-

als available to perform such work, and this accounts for the extremely low efficiency of the average human worker.

The ancients believed that there were only four elements,—fire, air earth, and water. Alchemists later maintained that there were only three chemical elements, — salt, sulphur, and mercury, or the soluble, the combustible, and the metallic. To-day there are eighty-one elements known to chemical science. This number of known elements, or the ultimate undecomposable constituents of matter, has been constantly increasing as our knowledge in science has advanced.

Primitive man in his early struggles for existence on this Planet of ours was classified as weak or strong. Existence depended upon physical strength and hardihood, and the law was the "Sur-

vival of the Fittest." Gradually through the ages other characteristics in man have asserted themselves and been recognized, and the mental, moral, and spiritual natures have developed, the characteristics or temperaments of men becoming more complex, with greater and broader capacity and capabilities. The number of human chemical elements has, therefore, increased from the few bearing entirely upon physical force until to-day their name is legion and covers every element in the complex personality of mankind, the result of the evolution of the human race.

As the eighty-one known chemical elements possess different characteristics, so each man to-day is different from his fellows in temperament and qualifications. Of course, analytically considered, the individual is a most complex

combination of an indeterminable number of mental, moral, spiritual and physical qualities; but in each case the result is a personality which, in its relation to an organization, is analogous to the chemical element in the laboratory. On the assumption, therefore, that each personality represents a chemical element, the obvious duty of the handler of men is to strive for the most harmonious and potential combinations of these chemicals if the highest efficiency is to be obtained and the organization is to be a success.

Chemicals as given to us by Mother Earth are seldom found in a pure state. Human chemicals as they arrive at the factory or office laboratory are generally far from the potency to which they are capable of being developed and refined. It should be the ambition of each human chemical to

develop into the truest, purest, element within his power of attainment. It should be the duty and pleasure of the human chemist to point the way and provide the ideal environment for the individual development of his human chemicals. Many chemicals are purified by fire, others by water, and still others by the influence of chemicals upon them, the chemical reaction absorbing and removing impurities. Some human chemicals are strengthened by the fire of experience and the heat of life's battles; others are improved by the rush of life's work which envelops and seems to immerse them beyond hope, but the onrushing current passes, leaving in its wake a more valuable and truer worker for life's responsibilities. There are some human chemicals that are developed by contact with other chemicals; as-

sociation with proper people will round out their lives and infinitely increase their possibilities of usefulness.

The Creator in His infinite wisdom made no bad or unnecessary chemical elements, neither can any man be considered hopelessly bad or useless if he is put in his proper place and is handled wisely and intelligently by the human chemist. One chemical element might say to another, "I am more important than you. I am white, you are black; I am heavy, you are light; I have power to move things in nature; you are inert, therefore you are unnecessary and useless." Gold is over twelve times as heavy as oxygen, but is it twelve times as important? What good would gold do us if we were deprived of life by the absence of oxygen required in respiration? Is the white salt more important than the col-

ored metal? Is the element with explosive tendencies more important than the peace-loving element that supplies a great human want? All are necessary in nature. All types and characteristics of men are apparently necessary in life. The laws of nature keep all the chemical elements in their proper place and in their ordained combinations. The wise human chemist will keep all his workers in the sphere and in combinations for which they are by nature fitted, and mentally, physically, and morally equipped. The factory, office, business organization, school, or wherever men congregate or labor is a laboratory; the man in charge of an organization, department, or small gang, is a chemist. The laboratory may be stocked with great quantities of human chemicals, or only a few, but from the available stock the

competent human chemist must produce every combination, activity or power needed in his business, industrial life, or departmental work, and he must know how properly to combine and use the various elements in order that the maximum efficiency and greatest achievement may result with the minimum loss through unnecessary fatigue and wasteful reaction, or from combustion caused by friction and explosiveness.

There is no profession in life more fascinating or more important than that of the technical chemist. There is no sphere of a man's work more interesting or more important than the handling of men, whether the number runs into the thousands or be so small as to be counted on the fingers of one's hand. The master human chemist must be an unprejudiced scientist, an unbiased student of

his men. He should be able to read and analyze his men just as the chemist can tell the contents of each of his bottles. He should know the characteristics of each individual and classify them according to deductions obtained from scientific observations rather than draw unreliable conclusions from general appearances. With this knowledge what wonderful combinations of power and possibilities of service he can produce. But let us suppose that the man who endeavors to fill the important position of chemist is not a scientifically trained man, and he rashly places chemical elements in wrong combinations and an explosion occurs. Who is to blame? Does the blame lie with each, both, or all of the chemical elements, or does the blame rest with the inefficient chemist? Surely the chemicals are not to blame for ig-

norance in combining on the part of the manipulator. It is not fair to the chemicals for any chemist to handle them rashly in defiance of nature's laws just because he has the power to do so. The human chemist should feel the moral responsibility of his stewardship and be cognizant of, and in full sympathy with the economic phase of his work. His efficiency will be manifested in placing men where their energies can be definitely and most economically directed toward the accomplishment of the work for which they are employed, thus eliminating all waste and non-productive human effort. Heat and explosiveness, such as wrath, temper, and lack of harmony, are wasteful; the human chemicals are consumed, less progress is made toward the goal of achievement; the human machine slows up, and sputters;

power is lost; harmony and good fellowship vanish, and the human chemist's department of work, measured by the standard of possibilities, is a failure.

Just as there are many affinities among the chemical elements, so there are many possible harmonious combinations of human workers; some of these harmonious combinations, however, of both chemical and human elements, may become violently explosive when subjected to an outside influence.

Some chemicals are poisonous, some are harmless; many of the poisons are extremely beautiful; many of the harmless chemicals are not attractive to the senses. The detailed knowledge of the various properties, limitations and field of usefulness of chemicals is gleaned by profound study and research work on the part of the

chemist, who goes far deeper than a simple classification based on weight, color, bulk and appearance. The master human chemist cannot depend upon the popular "sizing up" methods generally employed, but must make just as careful scientific analysis of the characteristics and temperament of the individual workman as the chemist does of his materials.

The carbohydrates and hydrocarbons are essentially different combinations of carbon, oxygen and hydrogen. Considering these elements individually, carbon is usually a dense, black substance; oxygen is a colorless gas, heavier than air, and hydrogen is a colorless, tasteless, odorless gas, much lighter than air. There is no department of chemistry that affords the scientific chemist more food for thought than the study of the countless, varied

combinations possible for these three elements. Brought together in one way we have carbolic acid, a deadly poison. Another combination of the same elements gives us alcohol, an intoxicating spirit. Still another gives us sugar, which has grown to be a household necessity. The same elements in varying proportions constitute butter, molasses, salol and oil of peppermint. Olive oil and camphor each contains about the same proportion of carbon, hydrogen and oxygen, but because of their different modes of combination the one is mild, nourishing and soothing, the other is aromatic, strong and poisonous.

If we consider the combination of only two of these elements, carbon and oxygen, in one way the chemist produces carbon monoxide, a highly poisonous gas. In another he produces carbon diox-

ide, industrially used in the manufacture of carbonated mineral waters, in the sugar and alkali industries, and in the artificial production of ice.

Hydrogen and oxygen together in certain proportions produce water; in another way the chemist obtains peroxide of hydrogen—so useful to the medical profession; but no proportioning of hydrogen and oxygen of themselves would ever produce sugar or butter.

We are impressed with the fact that the primary requisites of the successful chemist are not only an absolute and detailed knowledge of his materials in their elemental forms, in their effect one upon the other, and all the reactions produced by a multiplicity of combinations, but he must also have the desired conditions or environment to produce ideal results.

If the master chemist has the

rare skill, tact, and scientific knowledge of his human chemicals to place and combine them properly, keeping in mind their true characteristics and temperament, a world of great possibilities opens to him and to them. No one can foretell the achievement that is possible for the skilled chemist working with human chemicals that respond to the trained hand and sympathetic touch.

Many human chemists waste their own time and strength and annoyingly harass their workers by endeavoring to compel non-mixing types to produce the best results when placed in direct personal contact. Efficient team work is impossible if non-mixing human chemicals are brought together. Oil and water may be put into the same bottle, but no chemist can make them of them-

selves permanently mix. They instinctively draw apart and no matter how much the chemist sputters, scolds and shakes up the bottle the two fluids separate as soon as he leaves them alone, the oil rising to the upper part of the bottle as the water sinks to the lower part. A trained chemist would not attempt to mix oil and water alone, but employers, managers and foremen of labor are constantly endeavoring to bring about a corresponding physical impossibility. If, however, the chemist adds a third substance—soda or gum arabic—the oil and water will blend; even petroleum can be emulsified. The human chemist with his tact and good judgment, can often introduce among his non-mixing men, a natural harmonizer, a man who promotes good fellowship and team work.

No man in any organization, having the divine spark of immortal life within him should be avoided by any of his co-workers as one would a contagious disease, nevertheless, men who are not by nature fitted to work side by side, or in conjunction with each other, are never so placed by an employer who appreciates the characteristics and idiosyncrasies of his human chemicals.

The technical knowledge of the trained chemist shows him the limitations as well as the possibilities of his materials. He knows that it would be useless to endeavor to turn gold into silver or lead into platinum. Some employers or handlers of labor spend years in hopeless endeavors to change completely the basic characteristics of a man.

Notwithstanding persistent failure, attempts are continually be-

ing made to reduce the manifoldness of the actual chemical elements in nature to one single primordial substance. Employers and handlers of labor are wasting their time and substance in futile attempts to reduce men to one class or type, herding and handling all these distinct individuals in exactly the same way, no matter what the peculiar characteristics and temperament of each may be. There are managers of men who openly boast of their policy of treating all men alike. Understanding of true conditions and knowledge of the idiosyncrasies of the human individual transforms such a claimed virtue into a vice. Men, like chemicals, respond better to intelligent handling which gives due regard to their peculiar attributes and characteristics.

A manager of men, untrained in regard to the temperament and possibilities of his workers, is analogous to an unskilled manipulator of chemical elements whose work must necessarily be wasteful, unproductive, incomplete or even disastrous. Whereas an efficient, competent handler of men is one who brings out the best that is in a man and guides such a worker to the development and practical application of his inherent forces, the successful worker is one who applies himself along lines suggested by his peculiar characteristics and who follows out his own individual bent toward greatest efficiency.

As each chemical element is an entity, different and distinct from any other, so is each human element an entity and a personality, which, when guided by the human chemist to do work and perform

his peculiar function in life, feels and acquires what no inert substance can ever acquire, namely, the moral stimulus of responsibility. The success of the individual resulting from the proper application of his forces and the practical, satisfactory accomplishment of definite things in the work of life, leads to true happiness.

No chemical element is in a state of harmony unless it is in contact with other elements or influences which do not antagonize or irritate, and no human chemical or worker can ever be truly happy in his work unless he is fitted by nature for the work which he is performing, and unless his general characteristics and temperament are in harmony with his specific duties and environment. As the chemist is a man of science, so must the master human chemist train himself in the

great absorbing science of mankind, a subject so very broad that it must cover not only the physical but the moral and mental characteristics of the individual. A scientific human chemist will be a psychological analyst who will study the science of the individual in relation to environment and the science of the human mind, its power, function, and mental processes.

The day of the individual has arrived, and the far-sighted, sagacious handler of men, in recognizing this potent truth, is unconsciously working to dissipate the darkness of the old, traditional ineffectiveness surrounding employment, and herald the dawn of a new Industrial Day. The successful employer of the future will acknowledge that the mind of the worker is no less important for the final industrial outcome than the

machine. He will recognize and encourage that one quality which will forever save man from becoming a mere automaton—that divine spark of being himself—a personality—an individuality.

Let us consider the types of men that some human chemists have to deal with as analogous to the chemicals that the trained chemist has to handle.

There is the fiery, explosive, "don't touch me" type that the average employer would discharge as not being worth the trouble of handling, and who would blame him for doing so? Iodide of Nitrogen is so very sensitive and explosive that it will explode if rubbed with a feather, and if dry will explode when dropped two feet on to the surface of water. This is the extreme of sensitiveness, demanding extreme caution and care in handling. Very few laborator-

ies would have such a substance in the place and the chemist in charge is quite right in declining to have such dangerous material about him, nevertheless Iodide of Nitrogen is occasionally very valuable and it is possible that even the quick-tempered, super-sensitive, highly explosive "Iodide of Nitrogen" type of man could be used successfully in an organization if he is kept away from all substances that would upset and annoy him. Such a man's sphere of usefulness will always be very narrow and restricted; he stands in his own light and is his own worst enemy. His quickness consumes himself and strikes in as well as out.

Less sensitive, but still explosive of themselves, are the fulminates of silver and mercury. These chemicals require practical isolation in the laboratory, yet who will say

that they are useless? If a skilled chemist handles them and keeps them unruffled and normal, they perform, when required, special functions. Some handlers of labor would not keep in their employ an explosive human chemical, yet at times these explosive properties can be guided and trained so that in the hands of an expert chemist they become not so much explosion producing, as power producing chemicals—the kinds that make things go. To throw such men out of employment may result in detracting from the power and ability of the organization to really do things along certain lines.

Nitrogen Chloride is an oily liquid, intensely sensitive to explosion, but it is said that an American invented and operated an engine run by explosions of Chloride of Nitrogen, the dangerous oil be-

ing exploded just as fast as it was produced. Here is an illustration of a trained mind harnessing to the wheels of industrial progress a compound greatly feared in any laboratory.

Uncontrolled temper, haphazard flying into a passion, are inefficient, weakening, and wasteful. Every exhibition of weakness should be condemned and no excuse will justify weakness and error; nevertheless, what is natural and easy for one man is extremely difficult for another. Employers and handlers of labor should, with a trained chemist's skill, endeavor to safeguard and isolate their sensitive, explosive human chemicals, in order that their power can be used in true productive work instead of in useless fits of passion, which, unless eliminated, may tend to weaken and retard the positive progress of the entire organiza-

tion. Moreover, it is highly probable that the human chemist can tactfully bring his explosive men gradually to a realization that their progress and broad usefulness in general work is being impeded by explosiveness and lack of self control. As a result, isolation and special consideration may ultimately become unnecessary and good men saved to themselves and to the organization through the knowledge, patience, and tact of the human chemist.

There are some perfectly good chemicals, useful of themselves, that will explode violently if brought into contact with each other. Explosive mixtures are made of Chlorate of Potash and Sulphur; Red Phosphorus and Ammonium Nitrate; Carbon, Sulphur, and Nitrate of Potash make Gun Powder; but no chemist would condemn any of these in-

gredients because of their peculiar properties of exploding in contact with certain other ingredients. Moreover, it is a fact that all these stated chemical mixtures will remain inert and quiet unless the chemist wilfully or ignorantly subjects them to friction, heat or impact.

There are many chemicals, non-explosive of themselves and even averse to supporting combustion, which, when combined with other chemical elements, are consumed. There are many men, unobtrusive and of tranquil mind and friendly hearts, who, in certain combination with other human chemicals, neither commence nor of their own volition support combustion, but, nevertheless, are consumed, and their fine qualities destroyed.

There are chemicals which never take the initiative in combustion, but which nevertheless burn fierce-

ly and with tremendous power when once ignited. The quick combustible may be apparently inert or dormant until an oxidizing chemical is combined with it, and even then the explosion may be mild and the effect localized, but if a chemical, slow to ignite, but of great burning and flaming power, is combined with the combustible and oxidizing chemicals, the classified "slow to ignite" ingredient will cause a fiercely destructive conflagration. When we analyze the relation of human chemicals with each other and the functions they perform in different combinations, we find that it is sometimes the mild mannered, slow to anger, industrious worker, who, in the wrong combination with antagonistic elements, expends his energies in the wrong direction, radiating powerful influence in wasteful and unproduc-

tive expenditure of power and self consumption.

Again we see the importance of a skilled human chemist, trained in the science of human analysis, in preventing the wasteful, explosive organization, which is directly due to ignorant and inefficient supervision, and failure to recognize and place the individual peculiarities.

Metallic Sodium and Chlorine, considered separately, are of limited use, but we find them chemically combined in nature in the form of common salt, of vast commercial use and a household necessity. Many an earnest worker does not perform his best or most useful work and obtain the greatest possible results from his labors until the human chemist places him in the proper relation with other men in the organization; then each spurs on the other; each

is encouraged by the other, and team work, with true human co-operation, wins victories that no individual effort can obtain.

Again, some chemicals can mix acceptably in a certain environment, but would combine with expositive violence if the chemist endeavored to mix them in a different environment. We can consider Hydrogen and Chlorine, which combine slowly to form Hydrochloric Acid if kept in the dark. If the mixture is thrust into bright sunlight they combine with explosive violence. White Phosphorus, if kept in water or in an atmosphere of low temperature, is stable and harmless, although possessing great dormant power. If such Phosphorus is removed from water or is plunged into a warm or even normal temperature, it ignites promptly and consumes itself.

This fact is paralleled in human experience and many men in one environment or phase of activity will work harmoniously and effectively, either as a single unit or in combination with others, whereas they would not function properly or mix acceptably in some other division of work. Ordinary illuminating gas and air will remain inert until there is a spark, which immediately causes an explosion; therefore, extreme care must be used by the chemist to avoid any influence, either from outside the laboratory, or from the equipment and personnel within, coming in contact and exploding valuable gases. The wise human chemist not only knows his human chemicals, their affinities, temperamental poles, peculiarities and limitations, but he must safe-guard them from outside influence and antagonizing, trouble-making inside con-

tacts that disturb, ignite, and consume. Moreover, he himself must see that his equanimity is properly maintained so that there is no possibility of his actions producing the spark which ignites inflammable or explosive gases or combinations of chemicals.

How manifold are the characteristics and functions of the various chemicals! Scientists have attempted to classify them according to their gaseous, soluble, or metallic properties. In physical science the chemical elements are compared with such concepts as Mass, Momentum, Electricity, Entropy, and such. We cannot classify men according to their mass, i. e., their weight, height, or general dimensions or proportions; neither can we classify them according to their momentum, i. e., speed of movement or speed of thinking. A classification based

on their electricity or relative energy or enthusiasm would not of itself help us much, for misapplied energy and wasteful application of human forces are common. The classified division of entropy, referring to temperature changes which can be likened to coolness, passion, explosiveness and frigidity, are all interesting but of themselves prove little. The human chemists at work in life's many laboratories, great and small, must not be content in their analysis of men until they can place and know the characteristics and idiosyncrasies of their men just as minutely as the skilled, technical chemist of to-day knows and locates the chemical elements.

The human chemist should have the same broad views in regard to human chemicals that the scientific chemist has in regard to chemical elements. Some of the human

chemicals have apparently small and almost insignificant powers of performing useful work, but even some of these seemingly trivial functions may prove very important in the work of an organization.

A film of grease launches the mammoth ship, and catalyzers in extremely small quantities accelerate reaction. Peroxide of hydrogen under ordinary conditions decomposes very slowly. If we add a pinch of colloidal platinum to a barrel of peroxide it will decompose with intense effervescence, yielding water and oxygen, and at the end of the reaction the platinum black will be found in an absolutely unchanged condition. From this chemical fact we can draw two important lessons. First, that a small, apparently insignificant human chemical may prove to be very important in conjunc-

tion with others, and, secondly, that a relatively trifling human chemical, not properly handled or placed, might make an awful lot of trouble in the laboratory, and when all the fuss has blown over it will still appear innocent and harmless. An efficient human chemist, like his scientific brother, must be as wise as a serpent in his relation with the chemicals in his laboratory.

Scientists have been working of late to determine more definitely the stability of chemical elements and it is now said that Radium not only changes itself into another element, Helium, but actually causes other elements to change. Work along these lines, being of present day origin, we do not know what new laws will be found to regulate these most unexpected reactions, but the application to our human chemicals

in life's laboratories is clear. It seems that the chemical world teaches us what we know to be a truth in real life, that concentrated application and inner striving for improvement of ourselves will bring forth its own reward; moreover, the strong life, especially the one undergoing a change through growth and development exerts a powerful influence on others. If we heat Lead Tartrate in a closed test tube and then throw the residue into the atmosphere it will ignite spontaneously. If we apply ourselves to the heat of work and storing of life's knowledge, we pass from the test tube of hard experience into the world with a message and the influencing light and warmth of truth.

A trained chemist can accurately analyze an egg, stating its component elements in their exact relative proportions, but he is power-

less synthetically to create for us an egg with its distinctive physical qualities. The chemist can analyze and by synthesis he can duplicate chemically almost any substance in nature, but in many cases he cannot recombine the chemical elements to make the same substance that nature creates.

White phosphorus is a deadly poison, but amorphous phosphorus, with the same chemical symbol, is harmless and entirely different in its physical characteristics.

Two parts of hydrogen and one part of oxygen, chemically combined, give us water, but under different physical conditions the identical same chemical combination produces ice or steam. The same chemical compound, therefore, gives us a solid, a liquid, and a gas.

Carbon appears in nature in forms which vary physically all

the way from the lubricant, graphite, to the hardest substance known —the diamond.

Two workers may have similar characteristics in regard to conserving or scattering qualities; quickness of thought and action, mental, vital, or motive temperament and general mental endowment, but one may be a diamond among men, whereas, the other may be the ordinary carbon type of man that we appreciate but little. What is the difference? Is it the spiritual nature of man, the higher self, the mind that rises superior to matter, or is it the personality? Whether it be the imprint of the Creator on the soul of man or simply a moral, mental quality, it exists.

Scientists can prove that the Anthropoid Ape or Chimpanzee has a brain practically identical with that of a man, both as re-

gards size, proportions, and chemical characteristics, but we all know of the wonderful difference between the brain power of an animal and that of a man. Whether it be mind, will or spirit, the difference exists. Man alone has the capability of using his brain as a library full of shelves; of obtaining information, storing it, calling for it, expressing it, of hearing and reading with understanding and of transmitting his thoughts and expressions to others by words set forth in writing or speech.

With mankind the analogy to the variable physical properties of chemicals lies in the different way men acquire and use their knowledge; in the different way their faculties are utilized; in the development, depth, and expression of their personality; in their ideals and spirituality.

No human chemist can give a man that inner something which transforms a man into a magnetic soulful personality; this is something that a man must acquire or develop for himself according to his inherent possibilities.

I say that a man must work out his own salvation and that no human chemist can give a man a personality, but the master human chemist can discover the latent possibilities within his men; indicate these possibilities and encourage along well defined lines the highest individual development for each man under him. Such attainment may make a diamond type of man out of a carbon type, a leader out of a follower, a dominating, forceful worker out of a passive, negative individual.

Carbon is a common non-metallic chemical element, and yet it exists in the most expensive as well

as the cheapest of substances. Carbon is represented by the diamond and by graphite, and it is the principal constituent in coal and petroleum. A study of the carbon possibilities should be a source of inspiration to the human chemicals. Very often it is a matter of ambition, or will power, whether a worker will be of the ordinary coal type of man or the rare and precious diamond type.

All chemicals are not of the same commercial or industrial value. Some are rare and very expensive; others are found in profusion and have a very low monetary value. All are necessary in nature, but all have a pecuniary value dependent upon their relative scarcity in nature and the difficulty in obtaining these materials. Although each human element is necessary in the Laboratory of Life, it must not be assumed by the more com-

mon human chemicals that they have a value equal to that of the rarer orders. The compensation of workers depends on their worth just as truly as the market price of chemical elements depends on their rareness and intrinsic value. The policy of a Square Deal for all workers carries with it the spirit of true equity based upon values and producing power, and as a diamond cannot be bought for the same price as its equivalent weight or bulk of coal, so must a human element of valuable characteristics and high relative worth command more money in the mart of labor than the human element of lesser qualifications, no matter how true to his standard of possibilities each may be. In this idea of just reward for true worth lies the greatest stimulus to ambition and individual effort.

The functionality of a chemical element is its power of performing in a specific way by virtue of its peculiar constitution. The functionality of an individual in an organization covers his natural capabilities, his special aptitude for any peculiar work or activity, mental or physical. The functionality of a chemical element, or of an individual, is, therefore, the outward, visible, or apparent expression of the inner true individuality. The chemist indexes his chemical elements according to their functionality and keeps conspicuously before him at all times this knowledge of their different characteristics, power and possibilities. In business and in industrial life functions should not be classified as they are embodied in particular men, but men should be classified as they embody particular functions.

These principles applied to business or industrial life will not kill individuality, for they are founded on the basic principle of recognition of the individual, not only as an economic unit, but also as a personality, with all the idiosyncrasies, physical and mental, that distinguish a person.

Moreover, these thoughts practically applied, suggest an analytical study of the individual and not a general grouping and consideration of types. Many employers of men, and students of mankind, are so interested in studying types and deducing laws which apply to types in general that they lose sight of the fact that the individual is the basis of the study. The individuality of a worker should be demanded and his development encouraged along right lines in order that he may reach that plane where his peculiar

merits can be recognized and rewarded to the greatest extent. The characteristics demanded by the work to be performed and the qualifications of the workers selected to perform such work can be made to harmonize, and fitting the man to the job is the great channel through which effective progress and economic evolution in our industrial life must come.

The elimination of waste is the great economic factor of the present day. Economy should be a characteristic of a scientifically trained man. The chemist expresses his efficiency in a practical manner. His definite knowledge of the characteristics of his chemicals enables the scientist to know positively the chemicals required for the economical production of the desired compounds, as well as the exact relative proportion of each. Three chemicals of different

characteristics will never be coalesced by a competent chemist if two of the same chemicals will of themselves perform all the functions of the three. The relative cost of materials is also kept in mind, and an industrially efficient chemist will always use the least expensive and most easily obtained ingredients, provided, of course, the resulting compound is just as satisfactory as when made of more expensive chemicals.

The human chemist must be an economist and arrange his workers with discretion and prudence, keeping in mind not only the nature and volume of the work to be performed, but the capacity and peculiar functions of each individual, in order that no useless or inert human chemical may be placed in any combination, and in order that the earning power of the individual will be in harmony

with the simplicity or complexity of the work to be accomplished.

A skilled chemist husbands his laboratory materials and is frugal in the use of all the chemicals. He is trained to eliminate waste in the daily routine of his duties. If ten grams of a chemical are needed to perform certain functions he does not wastefully use one gram more than the required ten grams.

This is one of the most potent factors to-day in industrial efficiency and volumes could be written on the economy resulting from the elimination of waste. Much has been done in progressive plants to reduce the losses due to the uneconomic use of materials. Scientific, or task management has also materially reduced the "time factor" waste in regard to labor, but the greatest opportunity for the elimination of waste

in human effort can only be accomplished when the human chemist first knows the job in all its details, and knows the kind of labor to perform it; when he knows his men, their characteristics and relative value as determined by their earning power; knows their capabilities and natural aptitudes; knows how they can and will work on certain jobs, singly or in combination with other workers, and then places them to perform such work in harmony with his economic plan of operation.

We have considered to this point the analogy of the chemicals, chemist and laboratory, on the one hand, and the workmen, employer, and field of labor on the other. We have been compelled to assume that the chemicals had no voice in their part of the program of life and that the chemicals always acted impassively under the

direction of the chemist. Human chemicals, however, possess will power and in this one respect are not analogous to materials in the laboratory. The technical chemists can figure out exact results, and be entirely responsible for the action of his chemicals, but the plans of a most careful human chemist may always be thwarted by the wilful, stubborn or ignorant acts of opposition on the part of the human chemicals.

A knowledge of human analysis will help all intelligent workers to be more considerate of each other and more efficient in their relation to each other and to their foremen and managers.

There are some chemists who instinctively dislike to handle certain chemical elements, and there are some foremen and managers who do not care to have men with certain characteristics work for them.

A wise executive will train himself to have no positive feelings of dislike for any type of human chemicals, but he will always see that he does not saddle and handicap his willing assistants, in either his staff or line organization, with men who, by nature, are uncongenial and will not work harmoniously with their immediate superior officer.

As one chemical cannot do the work of another, but can perform only the function for which it was created, so men cannot acceptably perform work for which they are not by nature fitted. A conserving, "steady application" type of man would be unhappy and inefficient if he should be placed by the human chemist at work requiring the handling of many dissociated things. Likewise, a man of good mentality, but slow to think and slow to act, would make

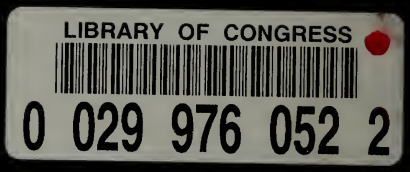
a failure of work requiring quickness in both thought and action, although this might be very acceptably performed by another man of far less mental calibre. Quickness, mental or physical, does not mean ability, just as the explosive qualities of chemicals do not tend to make them valuable.

The executive of an organization has, as a Master Chemist, a great responsibility in placing the men throughout the line and staff to perform the most efficient, and therefore the most economical amount of work, and this under conditions that tend toward happiness, health, success, and true harmony. The Manager, Superintendent, Foreman, Leading Man, or Gang Boss, is similarly responsible, to a smaller extent, depending entirely upon the amount of work which his department or his men have to perform and the num-

ber of human chemicals he has to handle and combine. Every employee or worker has also some responsibility. Being gifted with locomotion, powers of expression, initiative, etc., he will, if he is wise and considerate of his highest welfare, co-operate and be considerate of his fellow men, place a miner's safety screen around his individual lamp of personality so that such dangers as inflammable and explosive human chemicals coming in contact with his work will not consume his interest and single-mindedness and handicap him in his relations to his fellow men.

An organization which has as a fundamental principle a scientific knowledge and sympathetic understanding of its human elements, is building on a sure and firm foundation toward success. This knowledge of human nature is expended in the development of

the individual worker; finding for him the proper channel for expressing most efficiently through work his individuality. The returns are contentment, loyalty, devotion, and whole-hearted service.


LIBRARY OF CONGRESS
0 029 976 052 2